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Preface

Light in planetary atmospheres and other particulate media: A tribute to Professor Joop W. Hovenier

This special issue of *JQSRT* is intended to mark the outstanding scientific career of Professor Joop W. Hovenier and is a natural outgrowth of a dedicated workshop held at the University of Amsterdam on 15–16 December 2003.

Professor Hovenier started working on planetary atmospheres at Leiden Observatory in 1967. In that year, Professor Hendrik C. van de Hulst showed Joop a plot of the observed polarization of Venus as a function of phase angle. He remarked that a good interpretation of these observations in terms of microphysical properties of cloud particles had not yet been obtained and suggested Joop to think of this problem. Joop agreed and started studying single and multiple scattering theories. He soon found out that there had been a lot of confusion about symmetry considerations for polarized light transfer and that this had been a major stumbling block for performing efficient computer calculations of multiple scattering by cloud particles. Joop worked hard on this problem and eventually realized that all symmetries could be based on only three fundamental symmetry principles. This fundamental result was documented in his first paper on polarized light transfer published in 1969 [1].

After that Joop started collaborating with Dr. James Hansen of the NASA Goddard Institute for Space Studies, who spent part of a sabbatical year at Leiden Observatory and who was also interested in the interpretation of the polarization of Venus. The final result was the famous joint paper entitled "Interpretation of the Polarization of Venus" published in 1974 [2]. That paper documented perhaps the most spectacular achievement in planetary remote sensing and has been cited more than 200 times in scientific journals covered by the Science Citation Index.

In the mean time, Joop initiated the formation of a research group at the Vrije Universiteit (Free University) in Amsterdam. During the following years, Joop's group did a lot of theoretical and applied research on remote sensing of planetary atmospheres, including the terrestrial atmosphere. More than 60 undergradute students did research projects, 13 PhD theses were completed, and an advanced laboratory setup for precise measurements of light scattering by small particles was built [3].

The research results obtained by Joop and his students and collaborators have been documented in numerous papers, of which we specifically mention the development of the vector adding/doubling technique [4,5], the thorough analysis of fundamental symmetry properties of matrices transforming the Stokes parameters [6], and the frequently cited review of polarized radiative transfer [7]. The culmination of Joop's research is the recent comprehensive monograph on multiple scattering of polarized light in planetary atmospheres [8].

In May of 1995, Joop organized an International Workshop on "Light Scattering by Non-Spherical Particles" held at the Free University. This workshop resulted in a special issue of the *Journal of Quantitative Spectroscopy and Radiative Transfer* [9] and was so timely and successful that it triggered an entire series of conferences on this topic, each followed by a special *JQSRT* issue [10–14]. Joop also co-edited a book on light scattering by nonspherical particles [15] and has served for many years as an Associate Editor and an Advisory Committee member of the *JQSRT*. Joop's extensive "community service" has included memberships in a variety of boards and committees of scientific organizations in Holland over many years as well as in numerous scientific committees of international symposia, workshops, and conferences.

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Since 1999, Joop has been working at the Astronomical Institute "Anton Pannekoek" of the University of Amsterdam. His colleagues and students felt very strongly that his remarkable service to the planetary and light scattering communities should be celebrated during a dedicated workshop. The critical role that Joop has played over the years in advancing and promoting the *JQSRT* inspired the Organizing Committee of the workshop to apply to the Editor in Chief of the *JQSRT* Professor Prasad Varanasi with the idea of a follow-up special issue of the journal. The result of this endeavor is now in the hands of the reader.

We commend the authors for their efforts in preparing the manuscripts included in this special issue and the reviewers for the willingness to provide their time and expertise, sometimes on a very short notice. We also thank Professor Varanasi for making this special issue possible.

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